What is Claimed is:

1. A corneal contact lens comprising

a central zone having a posterior surface curvature,

a connecting zone having a posterior surface and provided adjacent and concentric to said central zone, said connecting zone having a shape defined as a sigmoidal curve, and

at least one peripheral zone having a posterior surface and provided adjacent and concentric to said connecting zone.

2. A corneal contact lens according to claim 1 wherein the curvature of the central zone is spherical.

3. A corneal contact lens according to claim 1 wherein the curvature of the central zone is toric.

4. A corneal contact lens according to claim 1 wherein the curvature of the central zone is aspherical.

5. A corneal contact lens according to claim 4 wherein the curvature of the central zone comprises a combination of annular spherical and aspherical zones.

6. A corneal contact lens according to claim 5 wherein the curvature of the central zone comprises a combination of spherical and aspherical zones.

7. A corneal contact lens according to claim 1 wherein the central zone is designed to correct presbyopia without contacting the cornea.

8. A corneal contact lens according to claim 1 wherein the central zone is designed to correct presbyopia by reshaping the cornea.

9. A corneal contact lens according to claim 1 wherein the meridional profile of the connecting zone is shaped to match the slopes of the central zone and the at least one peripheral zone on adjacent sides.

10. A corneal contact lens according to claim 1 wherein the meridional profile of the connecting zone is described by its axial length and horizontal width.

11. A corneal contact lens according to claim 1 wherein the junctions between the connecting zone to the central zone and the at least one peripheral zone require substantially no polishing or blending.

12. A corneal contact lens according to claim 10 wherein the meridional profile of the connecting zone is described by $y_s := A \cdot x^3 + B \cdot x^2 + C \cdot x + D$ (Eq. 1)

with the Y value for the junction (J_1) between the central zone and connecting zone defined by the equation

$$y_{j1} := \sqrt{r_b^{\,2} - J_1^{\,2}} \quad \text{(Eq. 2)}$$

the X value for the junction (J_2) between the connecting zone and peripheral zone defined by the equation

$$x_{j2} := J_1 + W \quad \text{(Eq. 3)}$$

while the Y value for the junction J_2 is defined by the equation

$$y_{j2} := y_{j1} - L \quad \text{(Eq. 4)}$$

with the coefficients A, B, C, D of Equation 1 are defined by Equations 5–8 as follows:

$$A := \frac{-\left[\left(\frac{-1}{2\cdot J_1 - 2\cdot x_{j2}}\right)\cdot M - \frac{1}{\left[\left(2\cdot J_1 - 2\cdot x_{j2}\right)\cdot\sqrt{r_b^{\,2} - J_1^{\,2}}\right]}\cdot J_1 + \left(\frac{1}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot J_1\cdot M + \left(\frac{1}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot y_{j2} - \left(\frac{1}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot x_{j2}\cdot M - \left(\frac{1}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot\sqrt{r_b^{\,2} - J_1^{\,2}}\right]}{\left[\left(\frac{-3}{2\cdot J_1 - 2\cdot x_{j2}}\right)\cdot J_1^{\,2} + \left(\frac{3}{2\cdot J_1 - 2\cdot x_{j2}}\right)\cdot x_{j2}^{\,2} + \left(\frac{1}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot J_1^{\,3} - \left(\frac{3}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot J_1\cdot x_{j2}^{\,2} + \left(\frac{2}{J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}}\right)\cdot x_{j2}^{\,3}\right]}$$

$$\text{(Eq. 5)}$$

$$B := \frac{-\left(A\cdot J_1^{\,3} - 3\cdot J_1\cdot A\cdot x_{j2}^{\,2} + J_1\cdot M + y_{j2} + 2\cdot A\cdot x_{j2}^{\,3} - x_{j2}\cdot M - \sqrt{r_b^{\,2} - J_1^{\,2}}\right)}{\left(J_1^{\,2} - 2\cdot J_1\cdot x_{j2} + x_{j2}^{\,2}\right)} \quad \text{(Eq. 6)}$$

$$C := -3\cdot A\cdot x_{j2}^{\,2} - 2\cdot B\cdot x_{j2} + M \quad \text{(Eq. 7)}$$

$$D := y_{j2} + 2\cdot A\cdot x_{j2}^{\,3} + B\cdot x_{j2}^{\,2} - x_{j2}\cdot M \quad \text{(Eq. 8)}$$

13. A corneal contact lens according to claim 1 wherein the at least one peripheral zone is formed as a truncated conoid and the relationship of the meridional profile of the at least one peripheral zone to the meridonal profile of the connecting zone is described by the angle the meridional profile the at least one peripheral zone makes with a line perpendicular to the central axis of the lens.

14. A corneal contact lens according to claim 1 wherein the at least one peripheral zone is formed as a truncated conoid and the meridional profile of the at least one peripheral

zone is described by the angle it makes with a line perpendicular to the central axis of the lens, its curvature and its extension.

15. A corneal contact lens according to claim 1 wherein the meridional profile of the at least one peripheral zone is substantially uncurved over at least a substantial portion thereof.

16. A corneal contact lens according to claim 1 wherein the meridional profile of the at least one peripheral zone is terminated by a rounded shape, to thereby provide smooth edge contour.

17. A corneal contact lens according to claim 1 wherein the meridional profile of the at least one peripheral zone is modeled as the quadrant of the ellipse having a ellipse center on an imaginary dividing line between the posterior and anterior surfaces of the lens which merges with the profile of the at least one peripheral zone and replaces that portion of the meridional profile of the peripheral zone in that region beyond the intersection of the short axis of the ellipse and the profile of the peripheral zone.

18. A corneal contact lens according to claim 17 wherein the dividing line is chosen to be at a location 10 to 90% of the thickness of the lens from the posterior to the anterior surfaces and the long axis of the ellipse chosen to be about 0.01mm to 2.0 mm in length.

19. A corneal contact lens according to claim 1 wherein the anterior surface of said lens is comprised of contiguous spherical surfaces.

20. A corneal contact lens according to claims 1 wherein the anterior surface of said lens is made to substantially the same shape as the posterior surface of said contact lens.

21. A corneal contact lens according to claim 1, wherein the posterior curve of said central zone in combination with the anterior surface curve will yield a desired optical power in said contact lens.

22. A corneal contact lens according to claim 1 wherein the anterior surface of said contact lens is designed to have analogous elements to said posterior surface and said analogous elements of the anterior and posterior surfaces are equally spaced from each other.

23. A corneal contact lens according to claim 1 wherein the anterior surface of said contact lens is designed to have analogous elements to said posterior surface and said

analogous elements of the anterior and posterior surfaces are unequally spaced from each other.

24. A corneal contact lens according to claim 1 wherein different [meridional surface profiles for each of said zones are designed at different angles of rotation about the lens central axis.

25. A contact lens comprising:

a central zone having a posterior surface with a curvature;

a connecting zone having a posterior surface provided adjacent and concentric to said central zone, and

at least one peripheral zone having a posterior surface provided adjacent and concentric to said connecting zone, said peripheral zone being integral with said connecting zone and being formed as a truncated conoid over at least a substantial portion thereof.

26. A contact lens according to claim 25 wherein the meridional profile of the at least one peripheral zone is modeled as the quadrant of the ellipse having a ellipse center on an imaginary dividing line between the posterior and anterior surfaces of the lens which merges with the profile of the at least one peripheral zone and replaces that portion of the meridional profile of the peripheral zone in that region beyond the intersection of the short axis of the ellipse and the profile of the peripheral zone.

27. A contact lens according to claim 25 wherein the parameters of connecting zone depth and peripheral zone angle are derived by fitting lenses on the cornea of a patient from one or more fitting sets selected from the group of fitting lenses having a fixed base curve and a fixed peripheral zone angle with a series of connecting zone depths, having a fixed connecting zone depth and a fixed peripheral zone angle and a series of base curves, having a fixed connecting zone depth and a fixed base curve with a series of peripheral zone angles, or sets of these three types contain one or more lenses that are marked with a plurality of visible concentric rings.

28. A contact lens according to claim 25 wherein the lens has a plurality of visible concentric rings formed over at least a portion thereof.

29. A method of fitting a contact lens by adjusting and assessing changes to the sagittal depth of a contact lens having a central zone with a posterior surface having a curvature

corresponding in a predetermined manner to the cornea of a wearer, at least one annular peripheral zone and an annular connecting zone, wherein changes in the axial length of the connecting zone produce directly corresponding changes in the sagittal depth of said contact lens.

30. A method of fitting a contact lens having a central zone with a posterior surface having a central zone with a posterior surface having a curvature corresponding in a predetermined manner to the cornea of a wearer, at least one annular peripheral zone and an annular connecting zone, wherein adjusting and assessing changes to the volume distribution of a void space formed beneath the connecting zone are provided by changing the diameter of the central zone, the axial length of the connecting zone and/or the radial width of the connecting zone without otherwise affecting the fit of the lens.

31. A method of fitting a contact lens having a central zone with a posterior surface having a central zone having a curvature corresponding in a predetermined manner to the cornea of a wearer, at least one annular peripheral zone and an annular connecting zone, wherein adjusting and assessing changes to the radial location of possible peripheral tangential contact of said at least one peripheral zone to the peripheral cornea are provided by changing the angle made by the peripheral zone to the central axis of the lens.

32. A method of fitting a contact lens having a central zone with a posterior surface having a curvature corresponding in a predetermined manner to the cornea of a wearer, at least one annular peripheral zone and an annular connecting zone, wherein adjusting and assessing changes to edge lift of said contact lens from the cornea of a wearer are provided by changing the extension of the lens beyond the point of peripheral tangential contact of the lens with the cornea of a wearer.

33. A method of establishing centration over the visual axis of a contact lens, comprising the steps of adjusting the location of possible peripheral tangential contact and extension of the lens beyond the point of peripheral tangential contact of the lens with the cornea.

34. A method of fitting, adjusting, visualizing, teaching, assessing and communicating a preferred geometry for a contact lens having a central zone with a posterior surface having a curvature corresponding in a predetermined manner to the cornea of a wearer,

at least one annular peripheral zone and an annular connecting zone, wherein a lens set is provided having the central zone diameter, connecting zone width, lens diameter and edge profile provided with predetermined shapes, and measuring the preferred corneal curvature needed to eliminate refractive error for a patient, measuring central corneal curvature of the patient's cornea, and determining the additional parameters of connecting zone depth and peripheral zone angle from fitting or computer modeling to provide a contact lens to reshape the cornea in a desired manner.

35. A method according to claim 34 wherein the parameters of connecting zone depth and peripheral zone angle are derived by fitting lenses on the cornea of a patient from one or more fitting sets selected from the group of fitting lenses having a fixed base curve and a fixed peripheral zone angle with a series of connecting zone depths, having a fixed connecting zone depth and a fixed peripheral zone angle and a series of base curves, having a fixed connecting zone depth and a fixed base curve with a series of peripheral zone angles, or sets of these three types contain one or more lenses that are marked with a_plurality of visible concentric rings.

36. A method of manufacturing a contact lens that comprises:

a computer system, where a specific set of data elements comprised of parameters related to fitting a contact lens having a central zone, a connecting zone adjacent and concentric to said central zone, and a peripheral zone adjacent and concentric to said connecting zone to a patients eye are input, wherein the characteristics in each of central and peripheral zones are independent from one another, and said connecting zone is modeled to transition between said central and peripheral zones,

a system that processes said data elements and computer lathe parameters and lens cutting data;

a computerized lathe that utilizes said lathe parameters and lens cutting data to form a contact lens that embodies the user's predetermined specifications.

37. A method for altering the shape of a patients cornea comprising the steps of: determining the desired corrected shape of a cornea,

imparting force to said cornea to alter its shape by means of a contact lens comprising a central zone with a posterior surface curvature corresponding to said desired corrected shape, and a first and at least one second annular zones concentric to said central zone,

said at least one second annular zone being positioned relative to said cornea and shaped such that upon redistribution of corneal tissue by said central zone, said at least one second annular zone will contact said cornea acting to neutralize forces imparted on said cornea by said central zone, and wherein said first annular zone connects said central zone to said at least one second annular zone.

38. A method of treating visual acuity deficiencies by wearing a contact lens for an amount of time to modify the shape of the cornea in a predetermined manner, comprising the steps of:

providing said lens with a central zone having a shape designed to impart force on said cornea, and at least one annular peripheral zone positioned relative to said central zone and shaped to selectively contact said cornea after an amount of redistribution of the corneal tissue by said force applied by said central zone, and an annular connecting zone connecting said central zone with said peripheral zone.

39. A computer program product for designing a contact lens comprising:

a computer usable storage medium,

a computer readable program code means, responsive to user inputs, for modeling said contact lens to have a central zone having a posterior surface curvature selected according to characteristics of a patient's cornea, and a first and at least one second annular zone wherein said at least one second annular zone is positioned and shaped to selectively engage said cornea upon alteration of its shape a predetermined amount, and said first annular zone connecting said central zone and said at least one second annular zone, and

computer readable program code means for calculating cutting parameters for a lathe used to produce said lens from a blank of material.

40. The computer program product according to claim 39, wherein the first annular zone is defined by at least a parameter of zone depth and the at least one second annular zone angle is defined by at least a parameter of it's angle relative to the cornea, wherein these parameters are derived by calculating a best fit lens from measurements comprising a flat keratometry reading of the patient's cornea, the patient's refractive error, a final target refractive error, a horizontal visible iris diameter,

and a lens code relating to a lens from a fitting set of lenses which contacts the cornea of the patient in a predetermined manner.

41 The computer program product according to claim 40, wherein the fitting set of lenses are selected from the group of fitting lenses having a variable series of base curves with a fixed connecting zone depth and a fixed peripheral zone angle, a fixed base curve with a variable series of connecting zone depths and a fixed peripheral zone angle, variable series of base curves with a fixed connecting zone depth and a plurality of concentric rings, a fixed base curve with a variable series of connecting zone depths and a plurality of concentric rings or having a fixed base curve and a fixed connecting zone depth and a series of peripheral zone angles with or without a_plurality of visible concentric rings

42. The computer program product according to claim 40, wherein the lens selected from the fitting lenses has a second annular zone angle which substantially tangentially touches the cornea at a desired location, and the diameter of the lens at which the tangential touch occurs is input to model said contact lens.

43. The computer program product according to claim 42, wherein the fitting lenses have a plurality of visible concentric rings provided thereon to allow the diameter of the tangential touch to be determined.

44. The computer program product according to claim 43, wherein the angle of the second annular zone is calculated from the determination of diameter of tangential touch observed when fitting another fitting lens having another angle for the second annular zone.